



**BI PLANE**  
TM

**FUN GAMES INC.**

**INSTRUCTION  
MANUAL**

JANUARY 1976

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**INSTALLATION:**

Open back of cabinet and MAKE SURE ALL BOARDS ARE PROPERLY SEATED INTO CARD CAGE. Plug into AC Power.

**PRICE PER GAME SWITCH:**

Located at the top of the memory board is the price per game switch. Up is one coin per game and down is two coins per game.

**GAME TIME POT:**

Directly below the price per game switch is the game time pot.

**WHITE PLANE SHOT RANGE POT:**

Directly below the game time pot is the white plane shot range pot. Turning clockwise increases shot range. Range should be adjusted to be equal to black plane range.

**VOLUME 2 POT (Location "2"):**

Volume for white plane is controlled by the top pot on the *sync* board. Clockwise increases volume.

**VOLUME 1 POT (Location "1"):**

Directly below the volume 2 pot is the black plane volume. Operates same as volume 2 pot.

NOTE: FOLLOWING CONTROLS ARE FACTORY SET. QUALIFIED TECHNICAL PERSONNEL ONLY SHOULD ADJUST.

**NOISE VOLUME:**

Location #4 controls shot and boom plane relative volume.

**PITCH 2:**

Controls pitch of black plane motor.

**TONE 2:**

Controls tone of black plane motor.

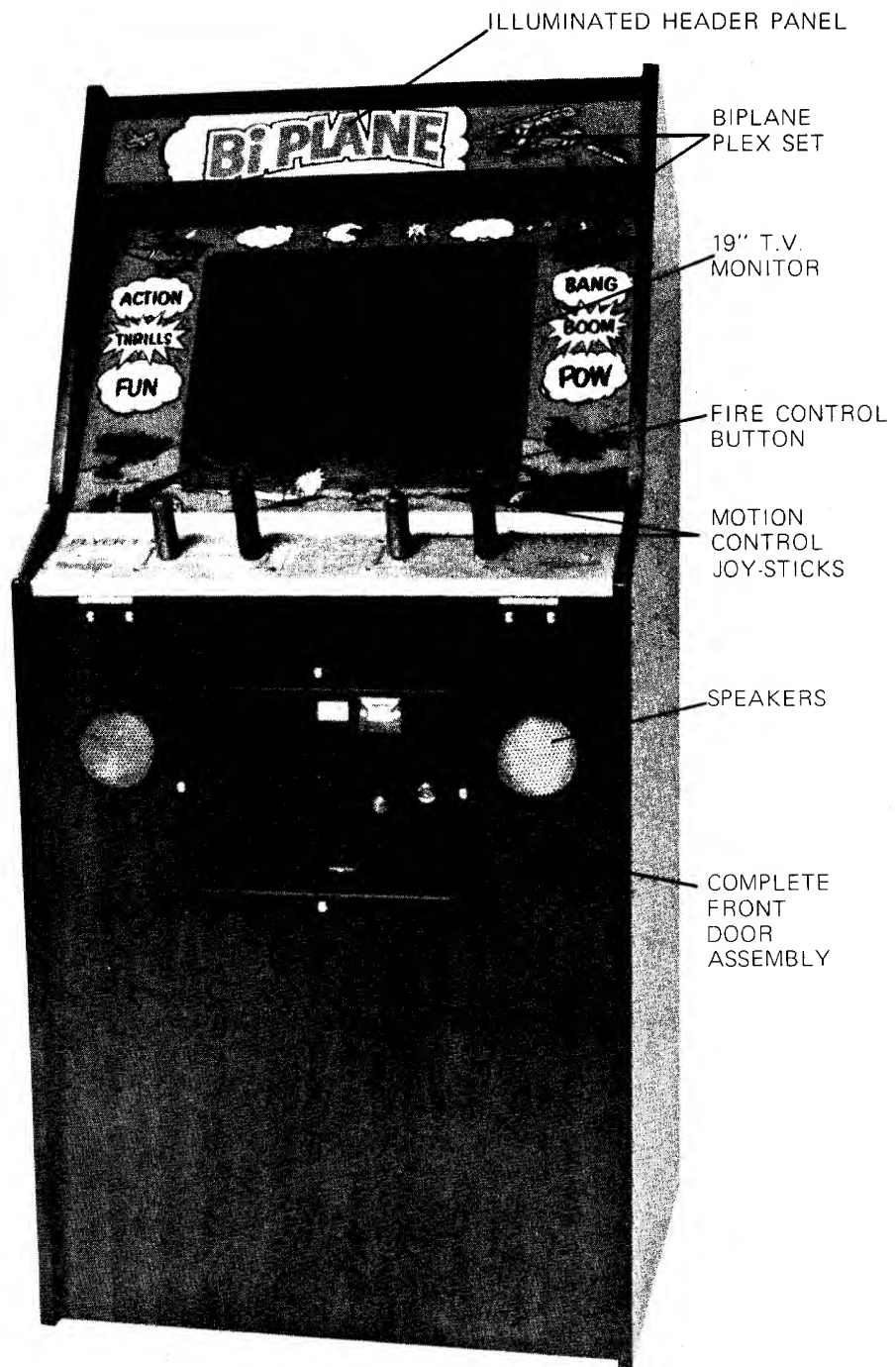
**PITCH 1:**

Same as pitch 2 for white plane.

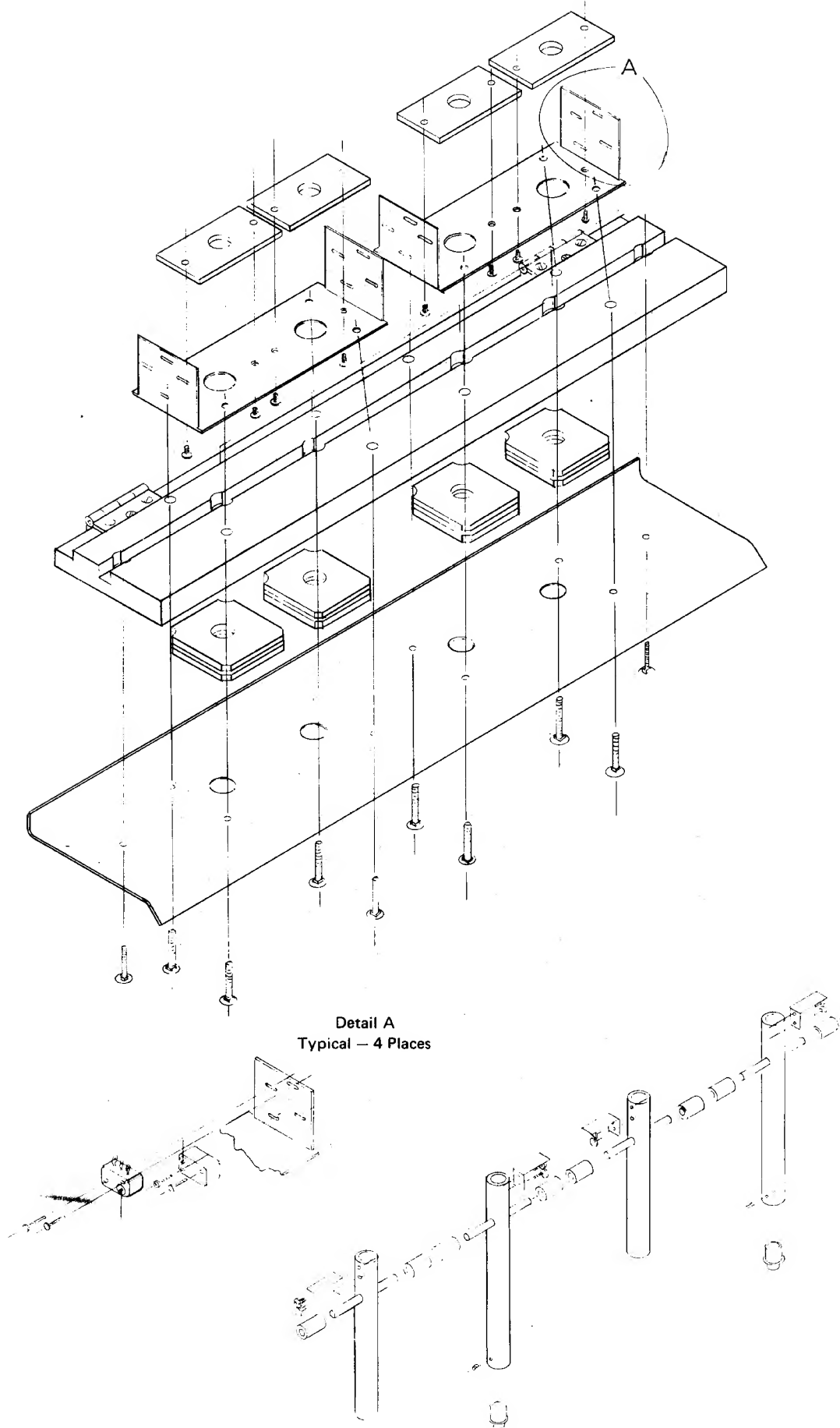
**TONE 1:**

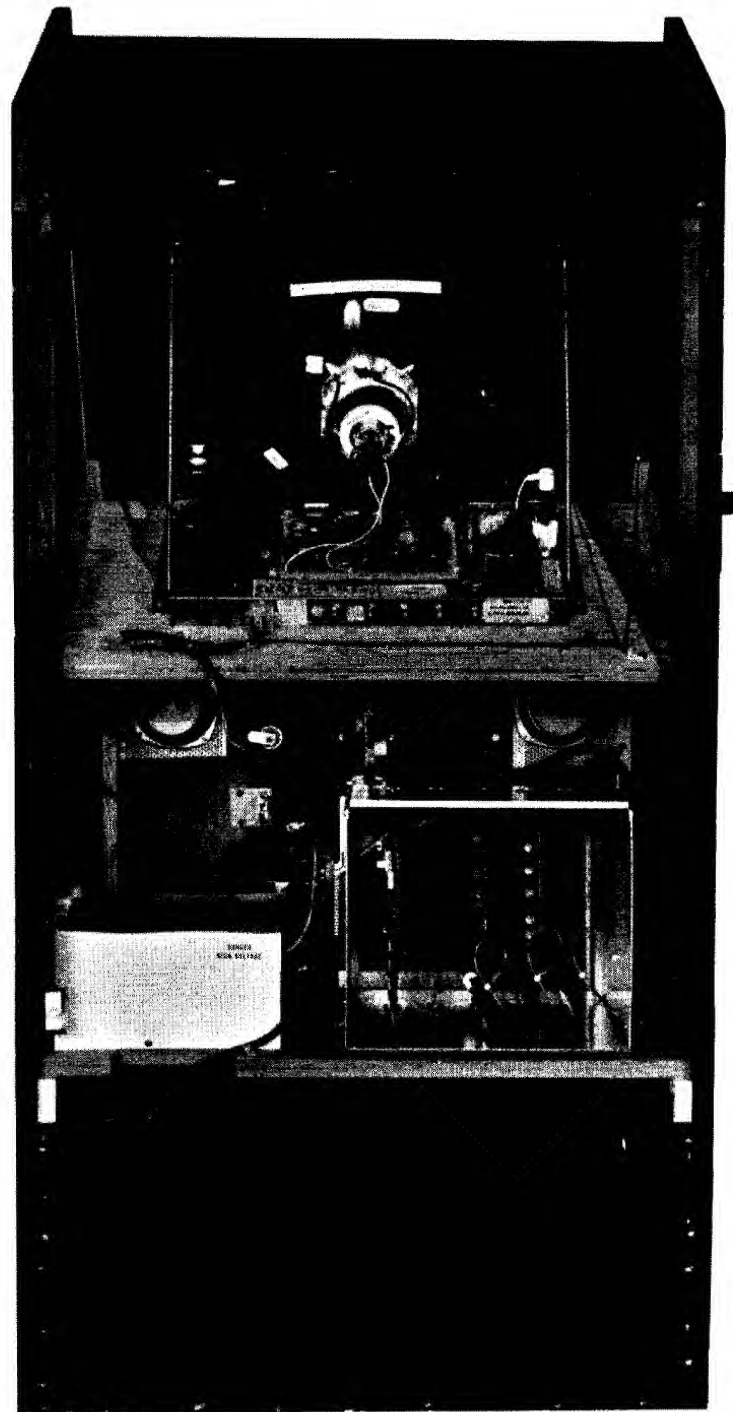
Same as tone 2 for white plane.

NOTE: BE SURE ALL BOARDS ARE PROPERLY SEATED, INCLUDING INTER-CONNECT BOARDS IN HARNESS CONNECTOR.

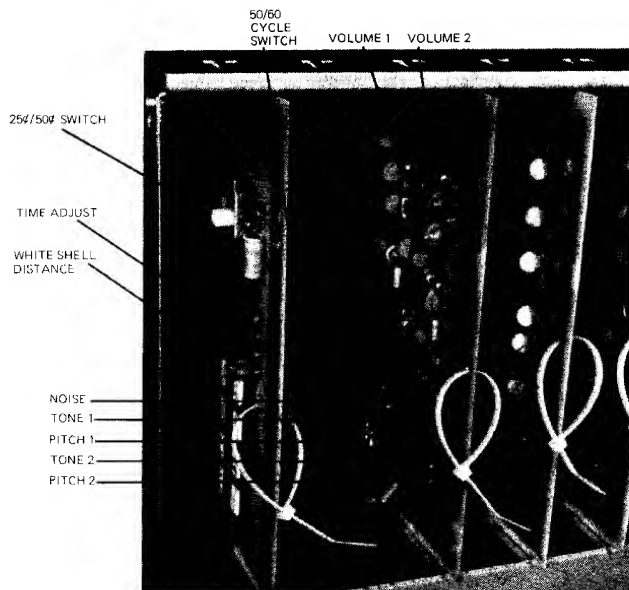
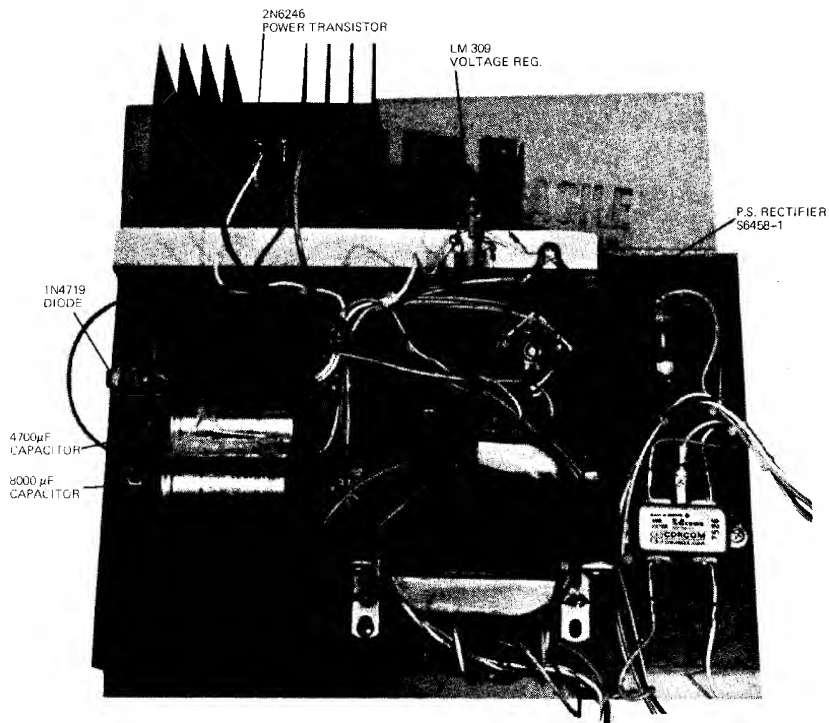


# COMPONENTS AND DESCRIPTION





# COMPONENTS AND DESCRIPTION



# TROUBLE SHOOTING

## TROUBLESHOOTING GUIDE

### AUDIO

1. Check speakers and connections
2. Adjust audio controls on synch board
3. Change synch board

### VIDEO (RIPPLE, DISTORTION, BLANK SCREEN)

1. Measure +5V
2. Check interlock switches
3. Shorted diode in P.S. rectifier
4. Change synch board

### VIDEO (SHAKE)

1. Adjust T.V. controls
2. Change crystal/4024 I.C. on synch board

### MOTION

1. Check control panel switches
2. Switch motion boards — if problem persists on same side (ie. black or white plane) change memory board

### SCORING

1. Change memory board

Important: Severe damage will occur if any board but the synch board is inserted in synch board socket.

1. Check control panel switches
2. Switch motion boards — if problem persists on same side (i.e., black or white plane) change memory board



# PRICE LIST

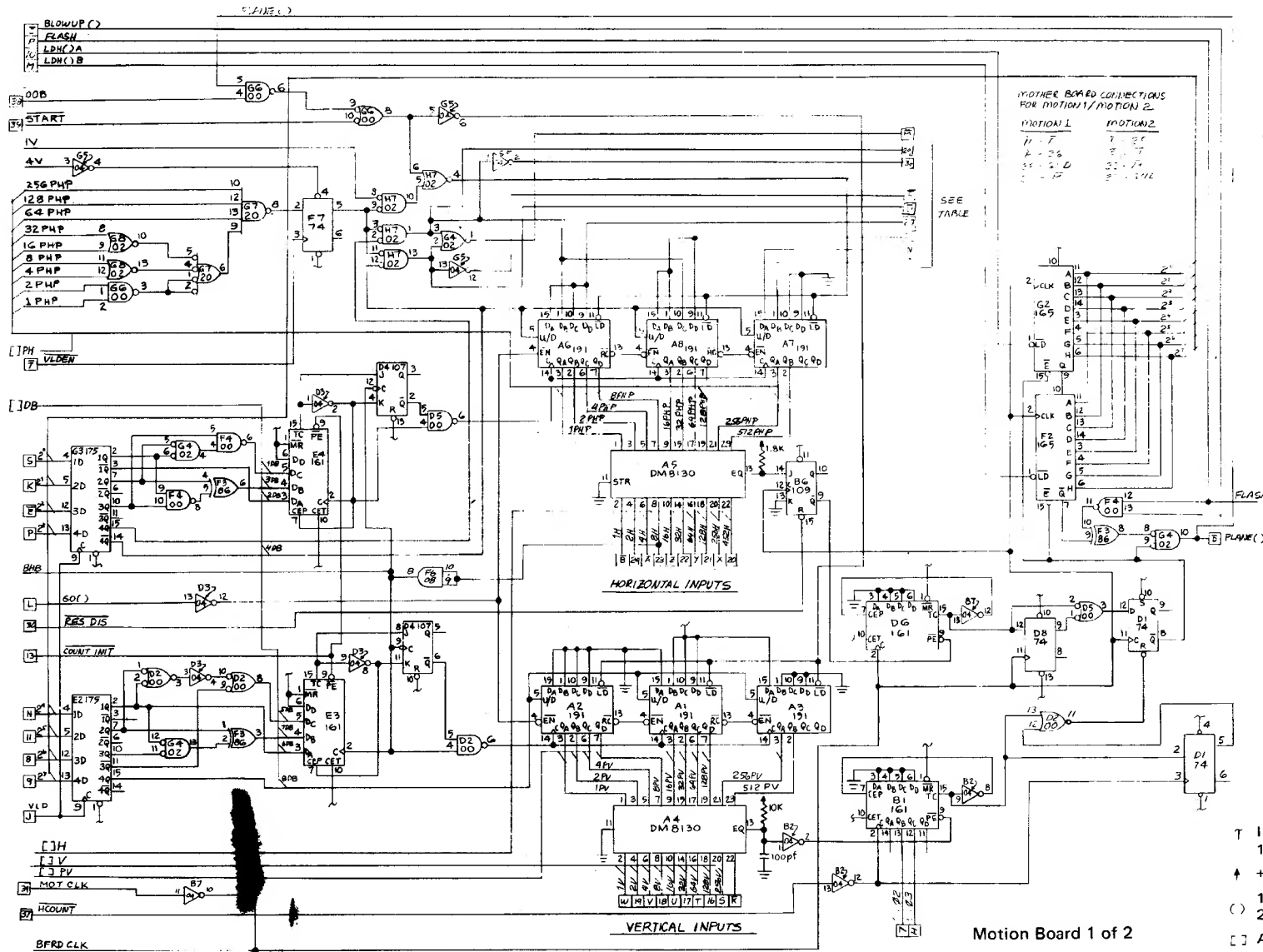
## PARTS LIST

PART #	DESCRIPTION	UNIT PRICE
300-200	Power Supply	75.00
500-206	Mother Board	75.00
500-201	Motion Board	250.00
500-202	Synch Board	250.00
500-204	Memory Board	250.00
500-200	Set of PC Boards w/Cage	750.00
600-200	Control Panel	75.00
400-100	Coin Door Assembly	55.00
34-64581	P.S. Rectifier	10.29
36-LM309	P.S. Voltage Regulator	3.54
42-0019	19" Monitor, Motorola	295.00
41-5006	Speakers	5.70
46-0051	Switch, Cherry, E51	2.82
46-0903	Fire Button, Switch	1.59
47-0001	Coin Counter	9.72
82-0001	P.S. Transformer	42.75
35-14318	Crystal 14.318 MHZ	5.04
37-4024	4024 I.C.	6.69
32-2N6246	2N6246 Power Transistor	3.69

**Minimum Order - \$25.00**

# SCHEMATICS

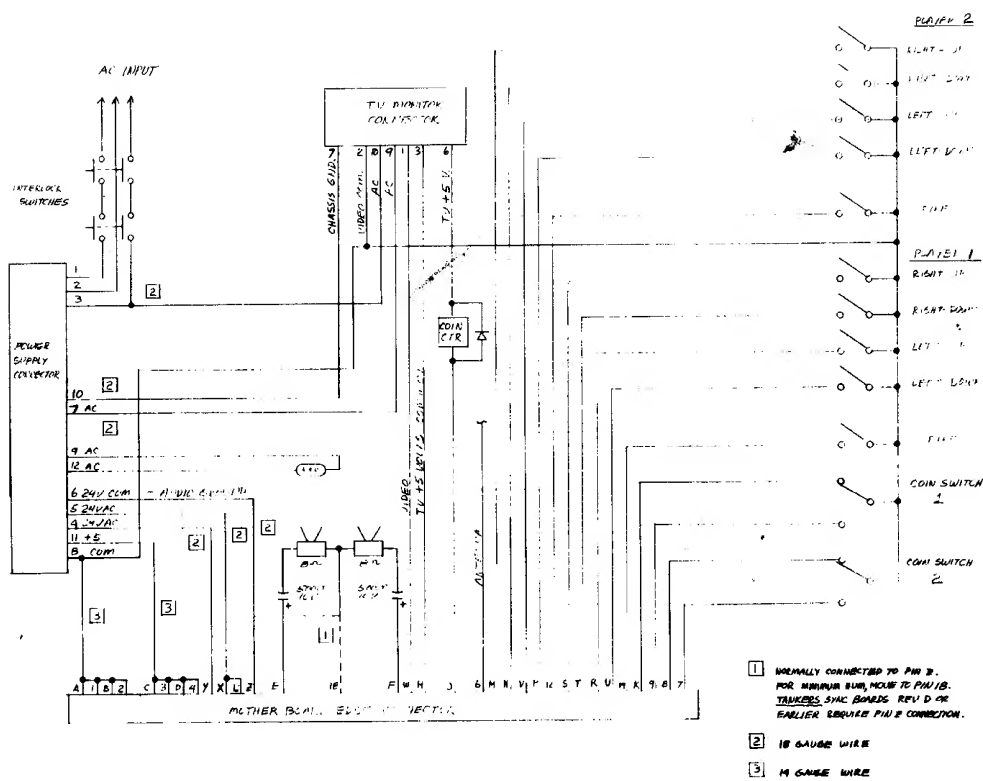
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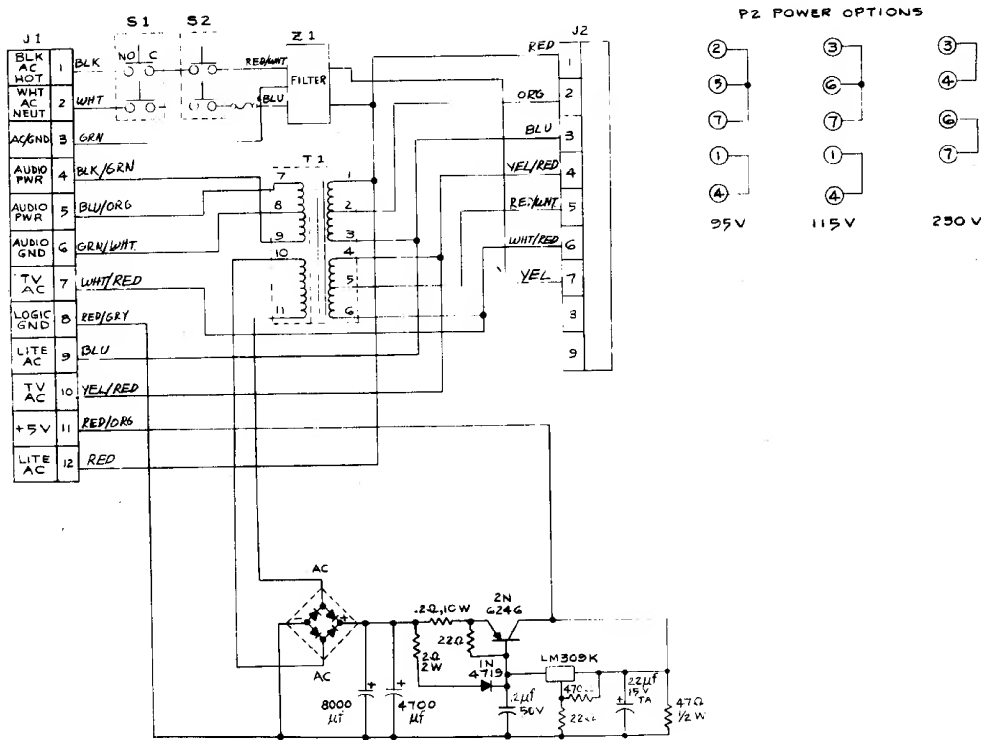
Motion Board 1 of 2



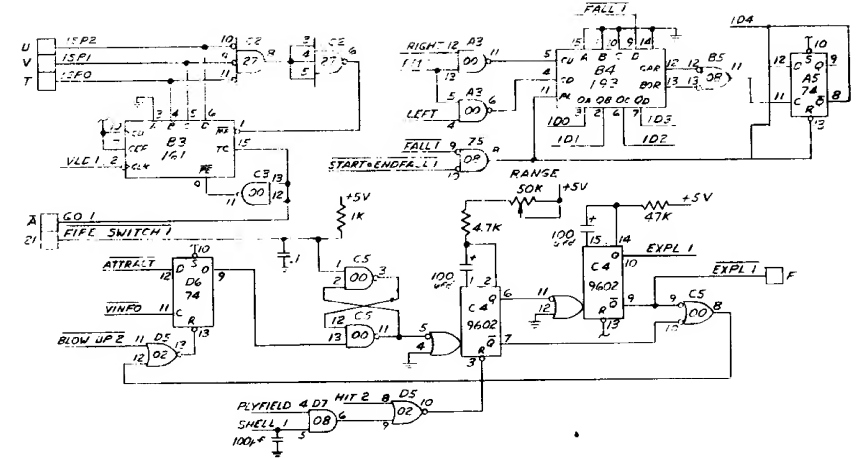
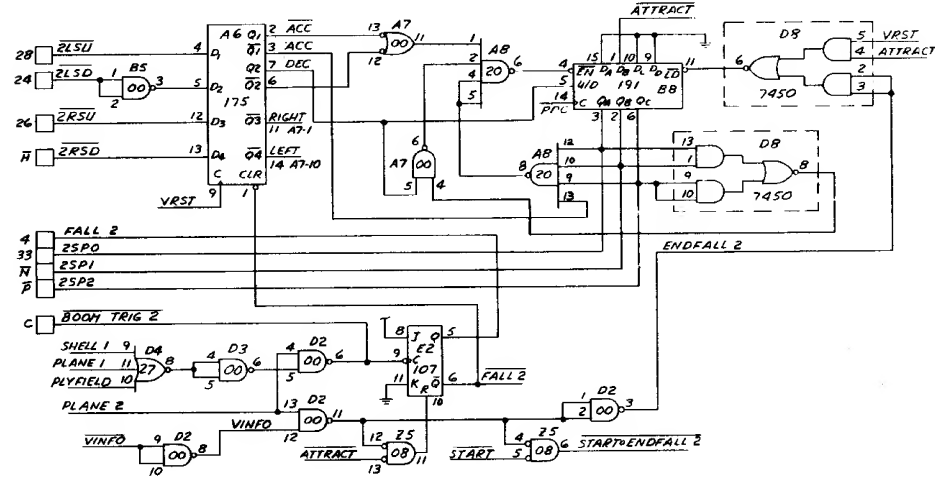
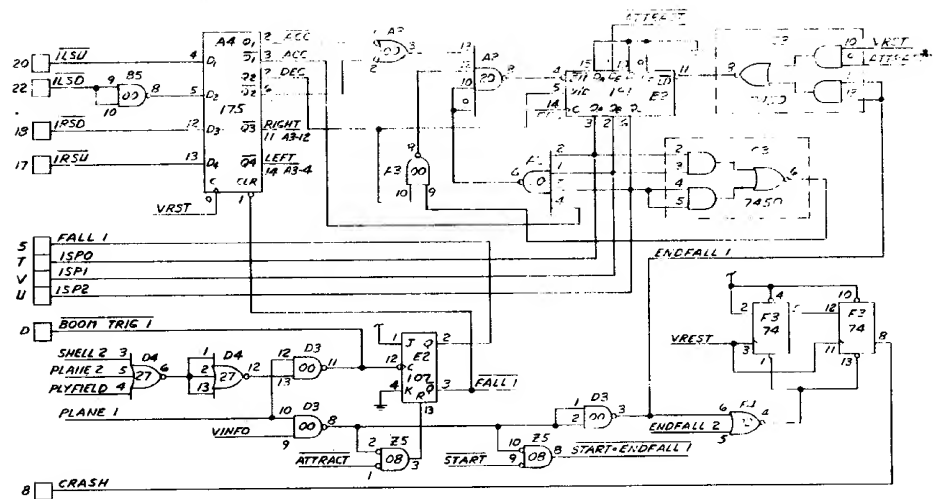
# SCHEMATICS



### Cabinet Interconnections



## Power Supply



## 14

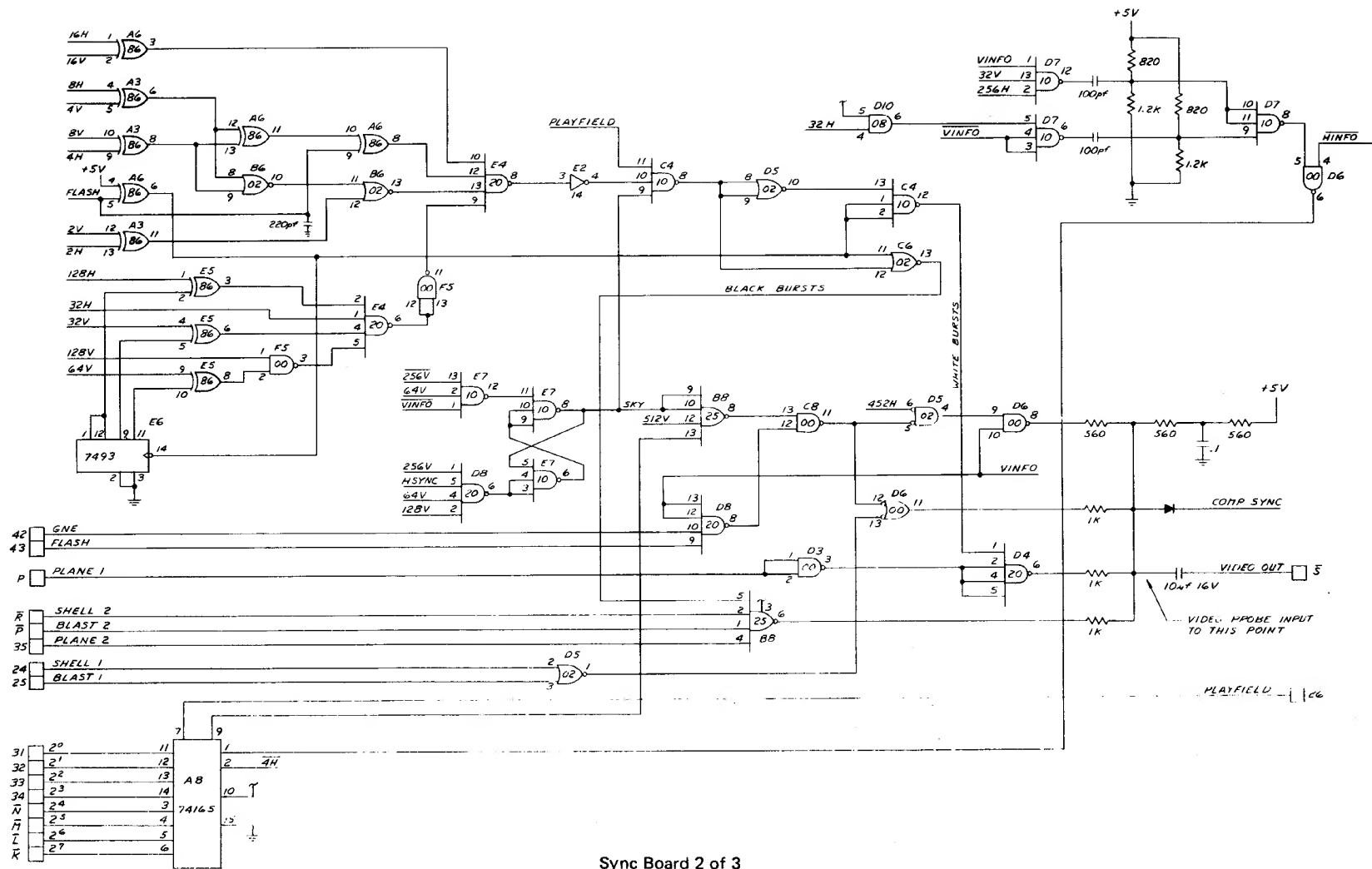




## 16







Sync Board 2 of 3

**SCHEMATICS**

## 18



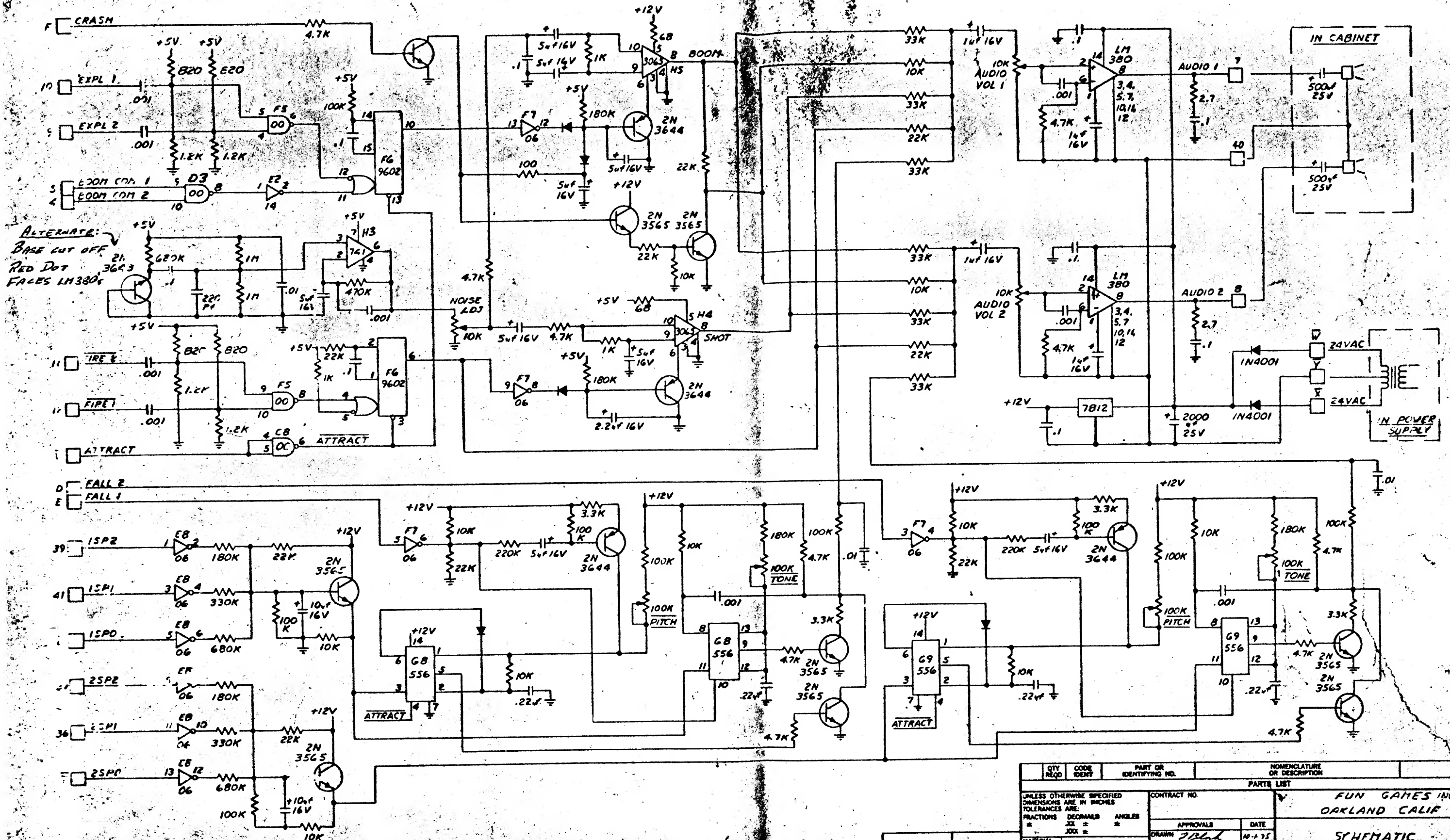
**FUN GAMES INC.**  
8410 AMELIA ST., OAKLAND, CA 94621 (415) 568-5225







REVISIONS			
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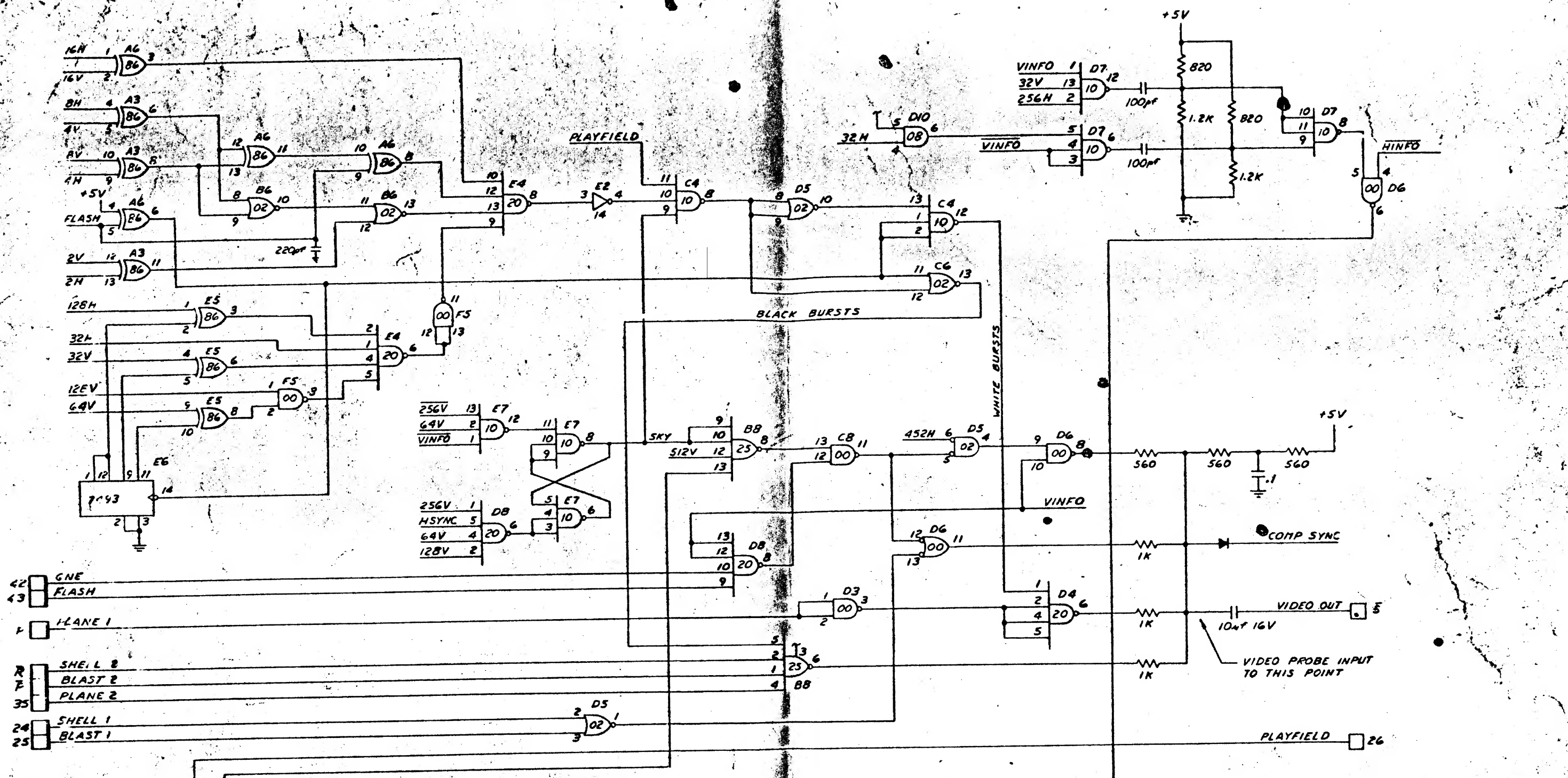


2. ALL RESISTORS ARE IN OHMS  
1/4 W, 5%, CC  
1. ALL DIODES ARE IN914  
NOTE: UNLESS OTHERWISE NOTED

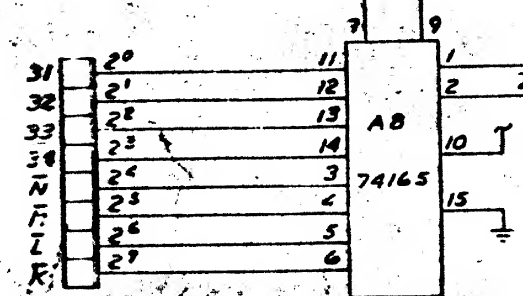
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PARTS LIST				
FUN GAMES INC OAKLAND CALIF				
SCHEMATIC SYN BOARD BI-PLANE				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES * .001 * *		CONTRACT NO.		
APPROVALS		DATE		
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CHECKED		10-28-75		
MATERIAL				
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APPLICATION		DO NOT SCALE DRAWING		
SIZE	CODE	CODE NO.	DRAWING NO.	
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SCALE				SHEET 1 OF 3



REVISIONS				DATE	APPROVED
ZONE	LTR	DESCRIPTION			

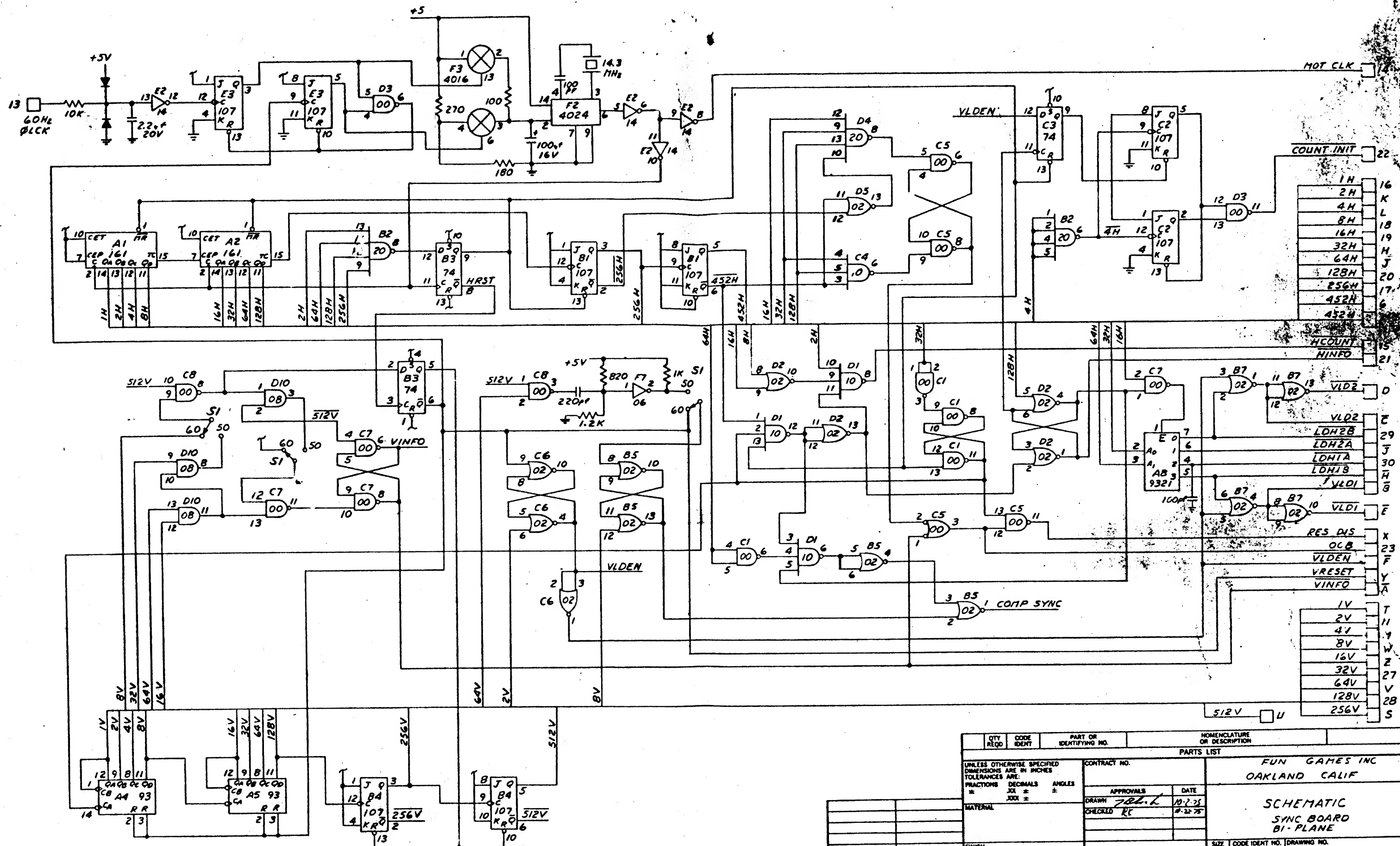


- 42 GNE
- 43 FLASH
- 1 PLANE 1
- 8 SHELL 8
- 7 BLAST 2
- 35 PLANE 2
- 24 SHELL 1
- 25 BLAST 1



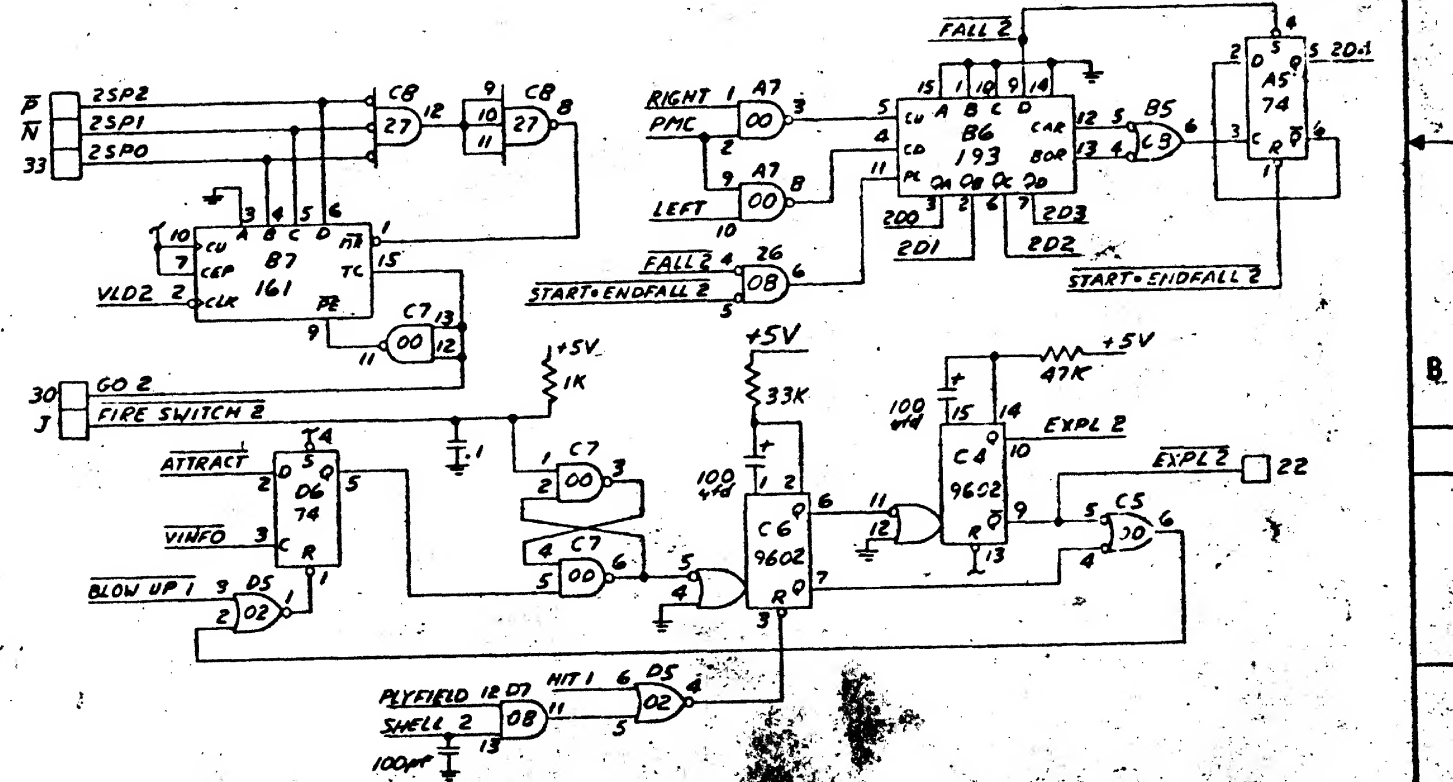
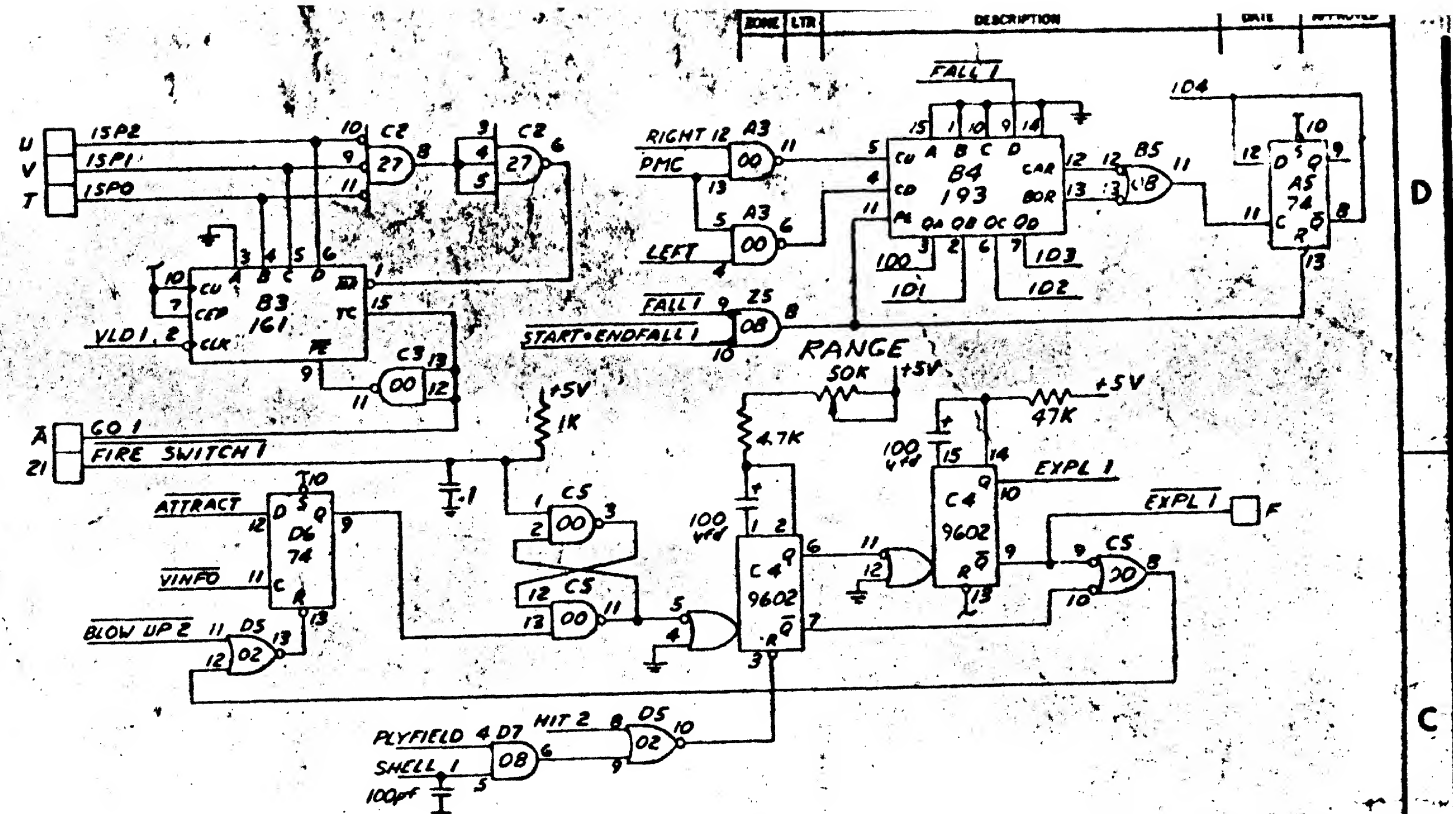
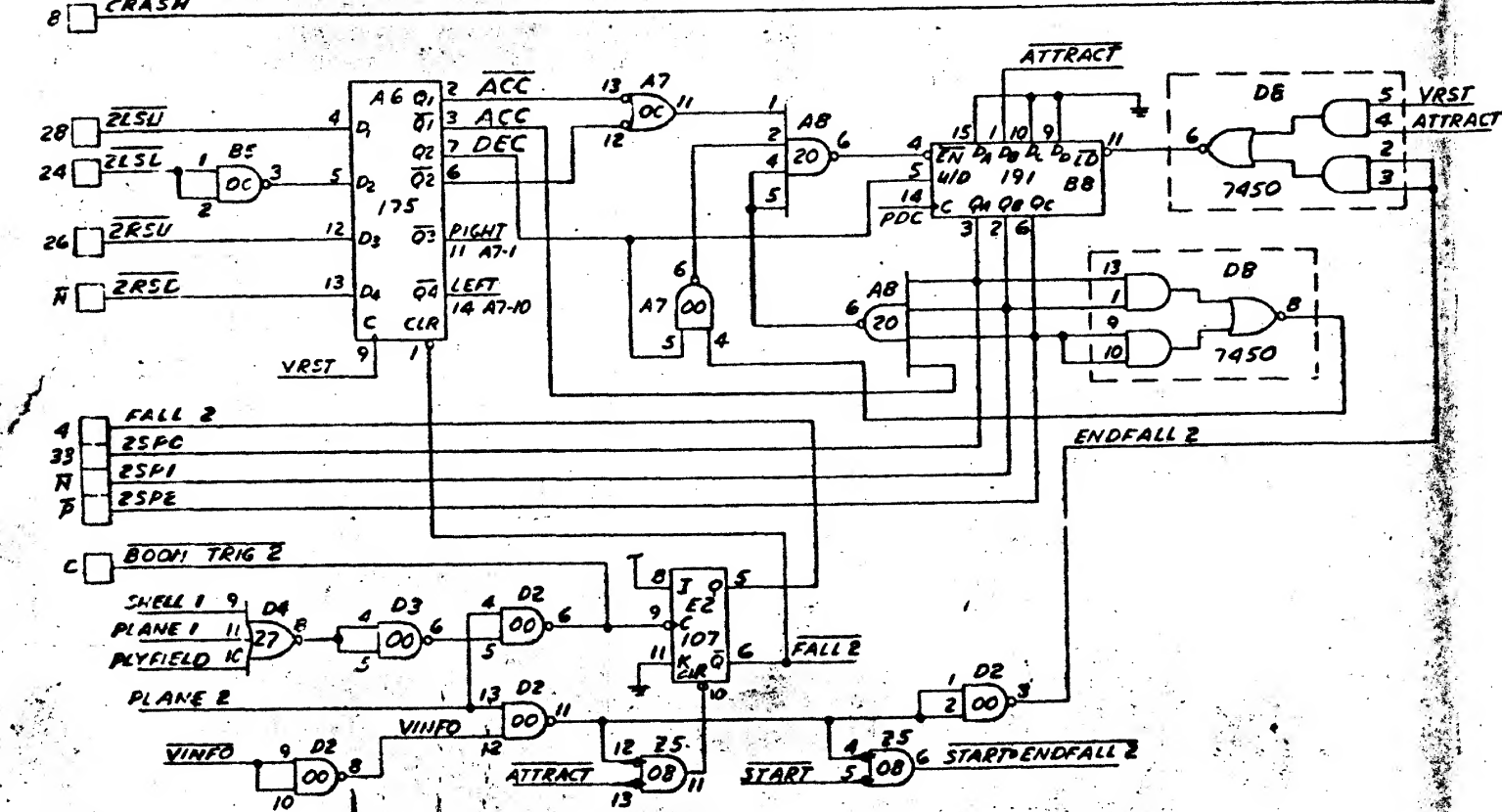
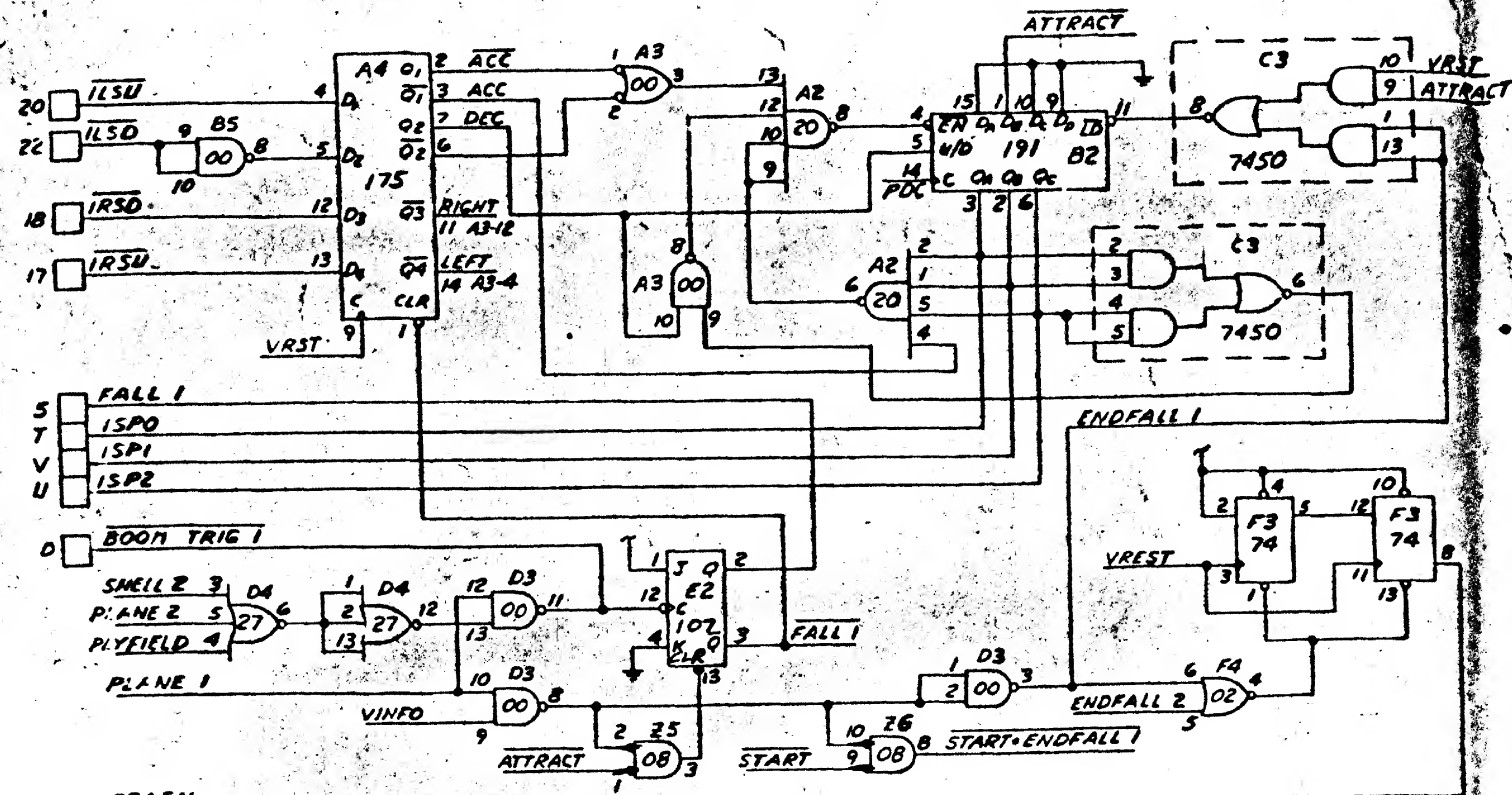
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MATERIAL			
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APPLICATION			
DO NOT SCALE DRAWING			
FUN GAMES INC. OAKLAND CALIF.			
SCHEMATIC SYNC BOARD B1-PLANE			
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SCALE			
SHEET 2 OF 3			

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE



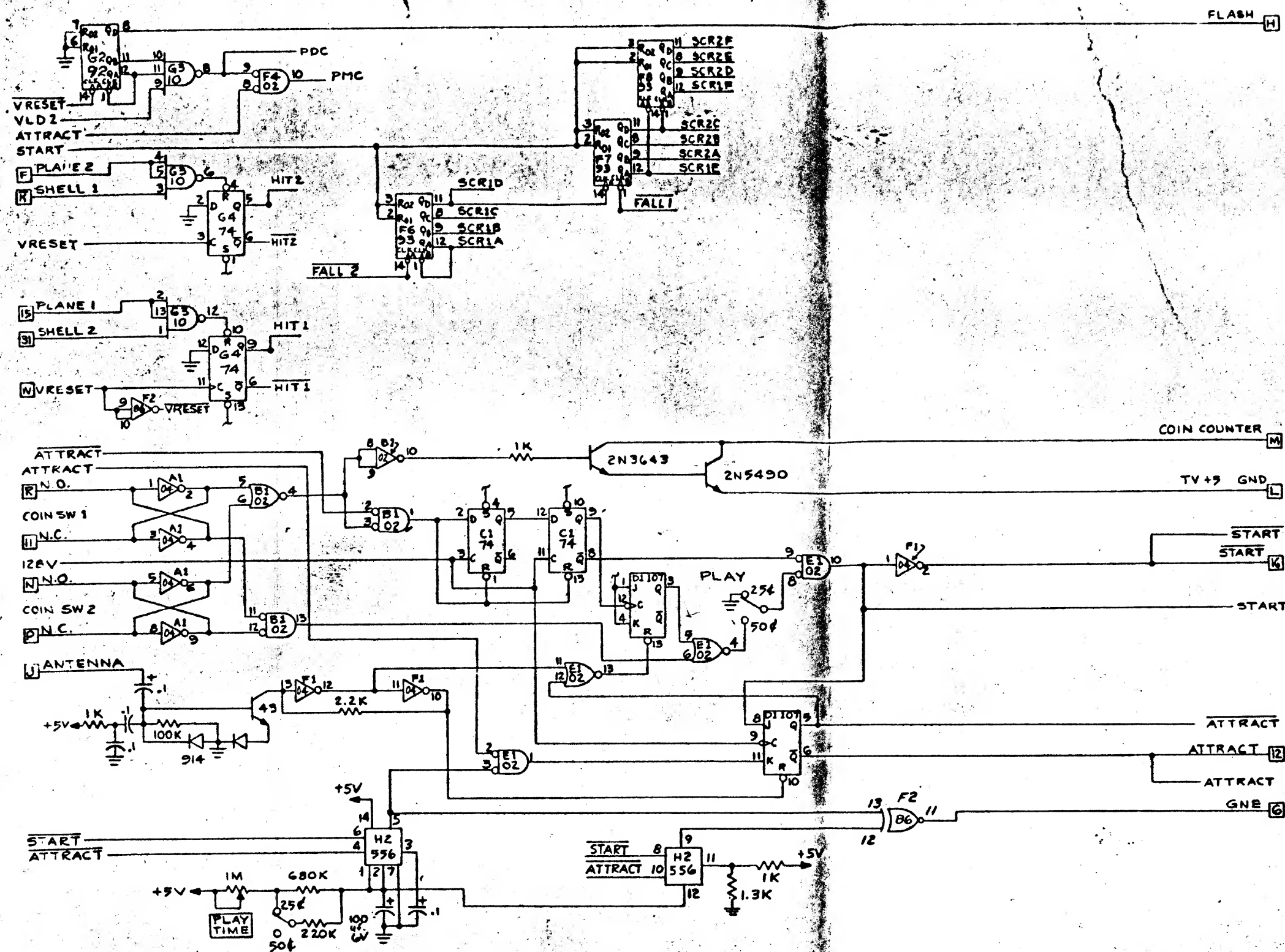
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CHECKED <i>RE</i>		10-22-75	
SCHEMATIC SYNC BOARD BI-PLANE			
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D			202
SCALE		SHEET 3 OF 3	





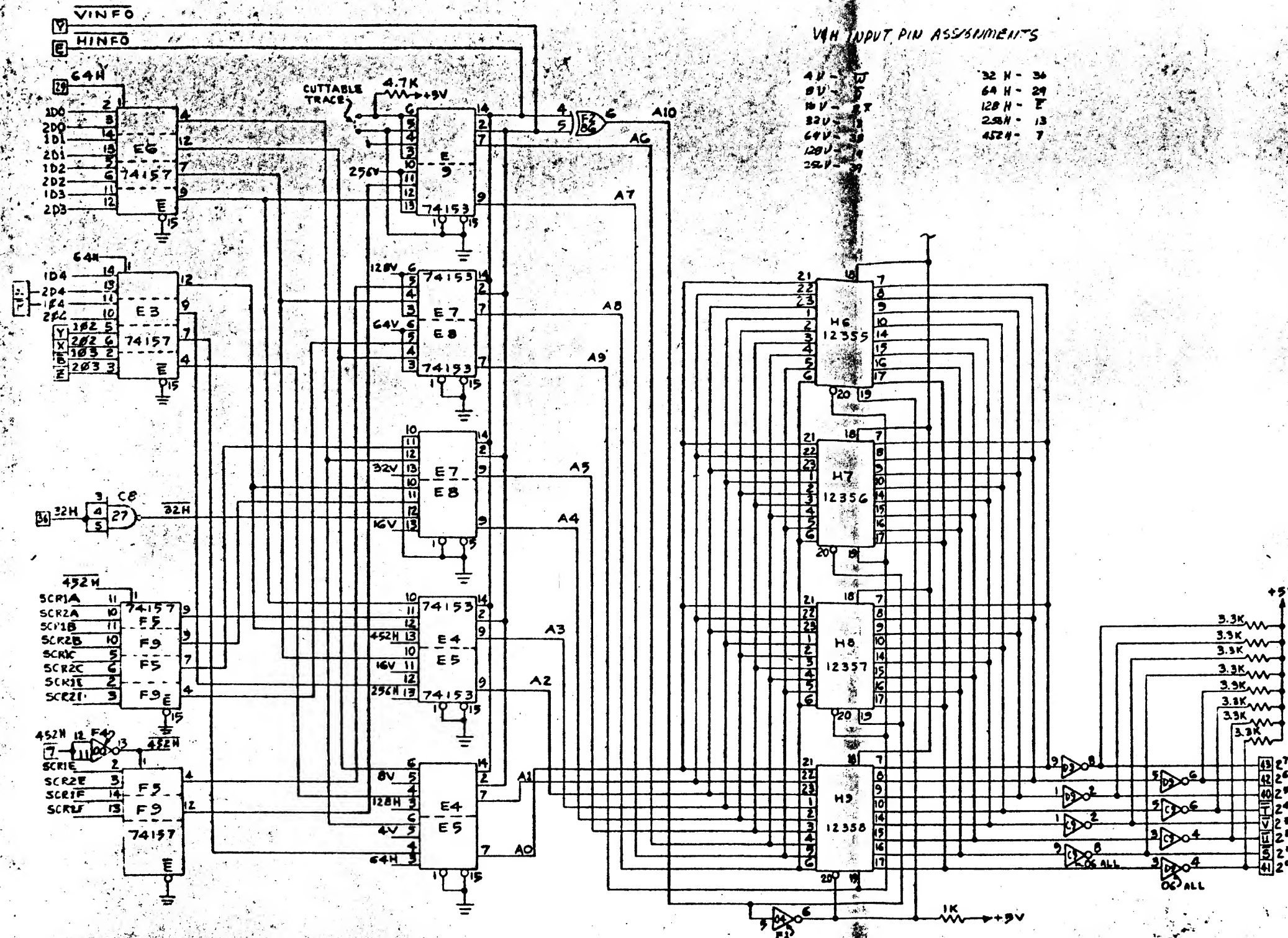
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DATE 10-8-75					
DATE 10-72-75					
MATERIAL					
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FUN GAMES, INC. OAKLAND, CALIF.					
SCHEMATIC MEMORY BOARD BI PLANE					
SIZE CODE IDENT NO. DRAWING NO.					
D 204					
SCALE 1/8" = 1"					
SHEET 1 OF 2					

REVISIONS				DATE	APPROVED
ZONE	LTR	DESCRIPTION			



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
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SCALE		SHEET 2 OF 3	





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NEXT ASSY		USED ON		SIZE		CODE IDENT NO.		DRAWING NO.	
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